In the claims:

1.   (Currently Amended) Pattern recognition apparatus for grouping nodes according to relationships with other nodes, the apparatus comprising:

an input for receiving an arrangement of nodes, said arrangement comprising at least two partitions of said nodes and with predetermined relationships between nodes across said partitions, and

a pattern recognition unit associated with said input, for ~~using pattern recognition on said nodes and said relationships to~~ automatically finding relationship patterns amongst said nodes using pattern recognition on said nodes and said relationships, thereby to form at least one group from nodes of a first of said partitions, wherein said nodes being formed into said group share relationships with same ones of a predetermined number of nodes in a second partition.

2.   (Original) The apparatus of claim 1, wherein said nodes in said first partition are users of a network, said nodes in said second partition are resources of said network and said relationships are access permissions.

3.   (Original) The apparatus of claim 1, wherein said nodes in said first partition are users of a network, said nodes in said second partition are resources of said network and said relationships are usage levels of respective resources by respective users.

4.   (Original) The apparatus of claim 2, wherein said relationships further comprise user access permission levels for respective resources.

5.   (Original) The apparatus of claim 2, wherein said at least one group is definitive of a user role on said network.

6.   (Original) The apparatus of claim 1, wherein said nodes in said first partition are entities having attributes and said nodes in said second partition represent said attributes, and said relationships represent a respective user possessing a respective attribute

7. (Original) The apparatus of claim 2, wherein said pattern recognition unit is associated with a search engine operable to use a search tree to begin with a single resource and its associated users, and iteratively to add resources and remove users not having a predefined relationship with said iteratively added resources, to meet a resource number, or a user number constraint.

8. (Original) The apparatus of claim 7, wherein said search engine is operable to use a homogeneity measure to determine whether to consider a candidate grouping in said search.

9. (Original) The apparatus of claim 7, wherein said search engine is operable to use a homogeneity measure to determine in which order to consider a candidate grouping in said search.

10. (Original) The apparatus of claim 7, wherein said search engine is operable within said iterative stages to add further resources common to a current set of users.

11. (Original) The apparatus of claim 10, wherein said search engine is operable to compute a set of all users related to a current set of resources.

12. (Original) The apparatus of claim 11, wherein said search engine is operable to consider for expansion all resources outside said current set of resources that have at least one relationship connection with a current set of users.

13. (Original) The apparatus of claim 8, wherein the set of users associated with each of said nodes is associated with attributes, and wherein said homogeneity measure is the percentage of occurrence of a given attribute, multiplied by the log value thereof, summed over all such users in said result.

14. (Original) The apparatus of claim 8, wherein the set of resources associated with each of said nodes is associated with attributes, and wherein said homogeneity

measure is the percentage of occurrence of a given attribute, multiplied by the log value thereof, summed over all such resources in said result.

15. (Original) The apparatus of claim 8, wherein said homogeneity measure is the percentage of occurrence of a given resource relationship for any of the users associated with at least one of the resources of said node, multiplied by the log value thereof, summed over all users of said node in said result.

16. (Original) The apparatus of claim 8, wherein said homogeneity measure is the percentage of occurrence of a given user relationship for any of the resources associated with at least one of the users of said node, multiplied by the log value thereof, summed over all resources of said node in said result.

17. (Original) The apparatus of claim 1, wherein said pattern recognition unit is operable to use said pattern recognition within an iterative tree searching process

18. (Original) The apparatus of claim 1, wherein said pattern recognition unit is operable to insert said groupings as an intermediate partition amongst said nodes, thereby to redefine said relationships through said groupings.

19. (Original) The apparatus of claim 1, wherein said nodes are arranged into three partitions, an intermediate one of said partitions comprising predetermined relationship dependent groupings of at least some of the nodes in a first of said partitions, said pattern recognition unit being operable to use said pattern recognition to add new groups to said intermediate partition.

20. (Previously Presented) The apparatus of claim 1, wherein said input is associated with a graphical expositor, which presents said input in a graph, said graphical expositor being operable to form said nodes into said partitions.

21. (Original) The apparatus of claim 20, wherein the graphical expositor is user interactive to manually modify the groupings discovered by the pattern recognition engine.

22. (Original) The apparatus of claim 20, wherein said graphical expositor is further operable to partition the graph into sub-graphs, each of the sub-graphs itself being a partitioned graph having at least two partitions, the sub-graphs being limited to a subset of the nodes in one of the partitions, and further comprising all the nodes in the other partition that are linked thereto, and wherein said pattern recognition unit is further operable to perform groupings on each of the subgraphs, and then to merge the results into a full graph.

23. (Original) The apparatus of claim 20, wherein said graphical expositor is further operable to partition the graph into sub-graphs, each of the sub-graphs itself being a bi-partite graph limited to a subset of the nodes in the second partition, and further comprising all the nodes in the first partition that are linked thereto, and wherein said pattern recognition unit is further operable to perform groupings on each of the subgraphs, and then to merge the results into a full graph

24. (Original) The apparatus of claim 20, wherein said graphical expositor, is user interactive to allow an operator to review user group associations and user resource relations, and to allow said operator to manipulate user access rights.

25. (Currently Amended) Pattern recognition method for electronically grouping nodes according to relationships with other nodes, the method comprising:
receiving an arrangement of nodes, said arrangement comprising at least two partitions of said nodes and with predetermined relationships between nodes across said partitions, and
~~using pattern recognition on said nodes and said relationships to~~ automatically finding relationship patterns amongst said nodes using pattern recognition on said nodes and said relationships, thereby to form at least one grouping of nodes of a first of said partitions, wherein said nodes being formed into said grouping share

relationships with same ones of a predetermined number of nodes in a second partition.

26. (Currently Amended) A reverse engineering tool for discovering structure in a partitioned nodal arrangement, the tool comprising:

an input for receiving an arrangement of nodes, said arrangement comprising at least two partitions of said nodes and with predetermined relationships between nodes across said partitions, and

a pattern recognition unit for ~~using pattern recognition on said nodes and said relationships to~~ automatically finding relationship patterns amongst said nodes using pattern recognition on said nodes and said relationships, thereby to form at least one group from nodes of a first of said partitions, wherein said nodes being formed into said group share relationships with same ones of a predetermined number of nodes in a second partition.